4-2014

2014 Pesticide Safety: Late Water, Frost, and Cost Containment

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Late Water, Frost, and Cost Containment

Carolyn DeMoranville

UMass Cranberry Station

Late water

- Why? – save costs, synchronize bloom
- All about your cost to do the practice!!
- Cost savings – eliminate frost runs, some pesticide applications
- Not cropping – synchronize bloom for flooding-out

Late Water Method

- 30 day re-flood starting about April 15
  - Weather and plant stage determines this
- Buds must still be dormant (ok if leaves are a bit green)
- Flood must cover the vines
- Ideal is warm water but less than 65F
- Plants lose carbohydrate but recover most of it within 2 weeks after flood

Late Water - Pros

- Suppresses fruit rot
  - No fungicide needed that year
  - Reduced rates or no fungicide in following year
- Suppresses cranberry fruitworm (CFW)
  - Many sites needed no sprays
- Suppresses cutworms
  - But watch for re-invasion after

Late Water - Pros

- Suppresses Southern Red Mite
  - Controlled in LW year and most of next
- Suppresses dewberry
  - Prevents spread
- Need less fertilizer
  - 30% less N
- Maybe less frost protection for the season

Late Water - Cons

- Loss of frost tolerance
  - After 2 weeks some; after 3 weeks all
- Temperature of the flood
  - Warm kills pests but can affect cranberry
  - Algae growth
- Early release less effective
  - 4 weeks killed 98% CFW
  - 2.5-3 weeks killed only 40-50% CFW
- COST?

Late Water – Bottom Line

- How much will it cost you to do this practice?
- Most conditions favor this as a good year.
- Crop loss is a risk.
- Fewer pesticides and less N fertilizer are potential benefits, also potentially fewer frost events (but not guaranteed).

Short May Floods

- 24 hours
  - Un-webbed worms (false army, blossom, gypsy moth)
- 48 (up to 72 hours)
  - Webbed worms – BHF, YHF (they must have hatched – if some haven't you could still have problems later)
  - Dodder: 3-4 weeks after first emergence – timing may match up with BHF
  - NOT Spag
- Must be able to move water fast and cover the vines completely

Spring Flash Flood - When?

- Early to mid May – BEFORE roughneck
- Cloudy, cool – not above 75-80F air temp (less carbohydrate impact)
  - But warm water kills pests better (less oxygen)
- Timing for pest development
  - BHF – eggs must be hatched but worms small
  - Dodder – must be germinated but not attached to cranberry

Other Cost Reduction Information

- Excellent presentation at the CCCGA winter meeting and follow-up CCCGA April newsletter article by Matt Beaton.

- Mowing – eliminates crop but there is a cost to mow and fertilizer and weed management needs after as well as scouting for leaf-feeder pests.

Costs, continued

- Bloom flood – crop elimination
  - 4 to 5 days
  - A bit past full bloom
  - LW can synchronize bloom for this
  - Cut N by 50+%
  - Scout for insects
- Summer flood
- Irrigation scheduling

Costs, frost

- ‘Frost out’ for crop elimination
  - Protect for frost early
  - When tolerance increases, stop protecting
- Frost flows (up into the vines only)
  - Can be used for multiple days until tolerance reaches 25°F
  - Depends on your ability, cost to flood

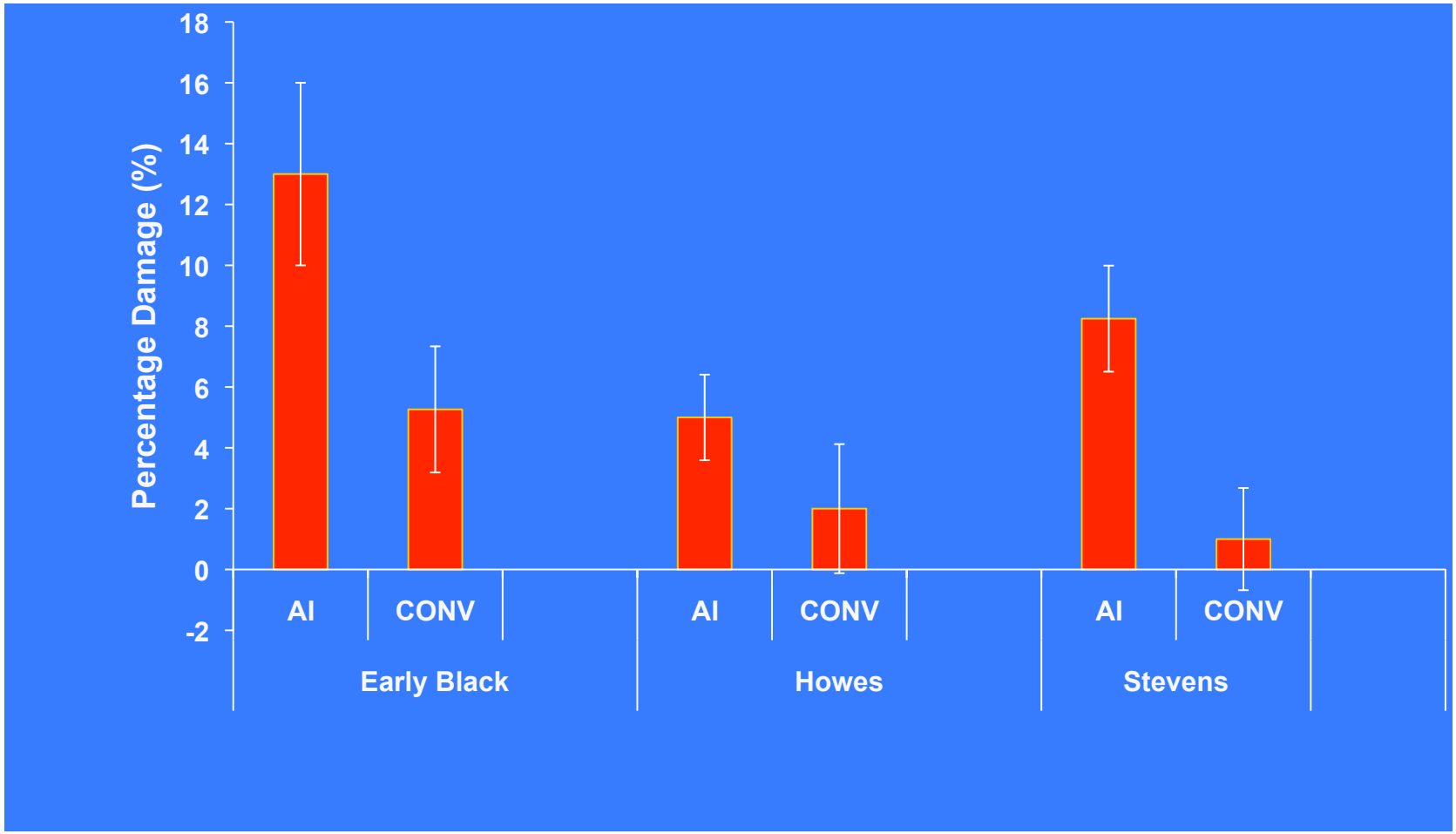
Frost cycling
Peter Jeranyama

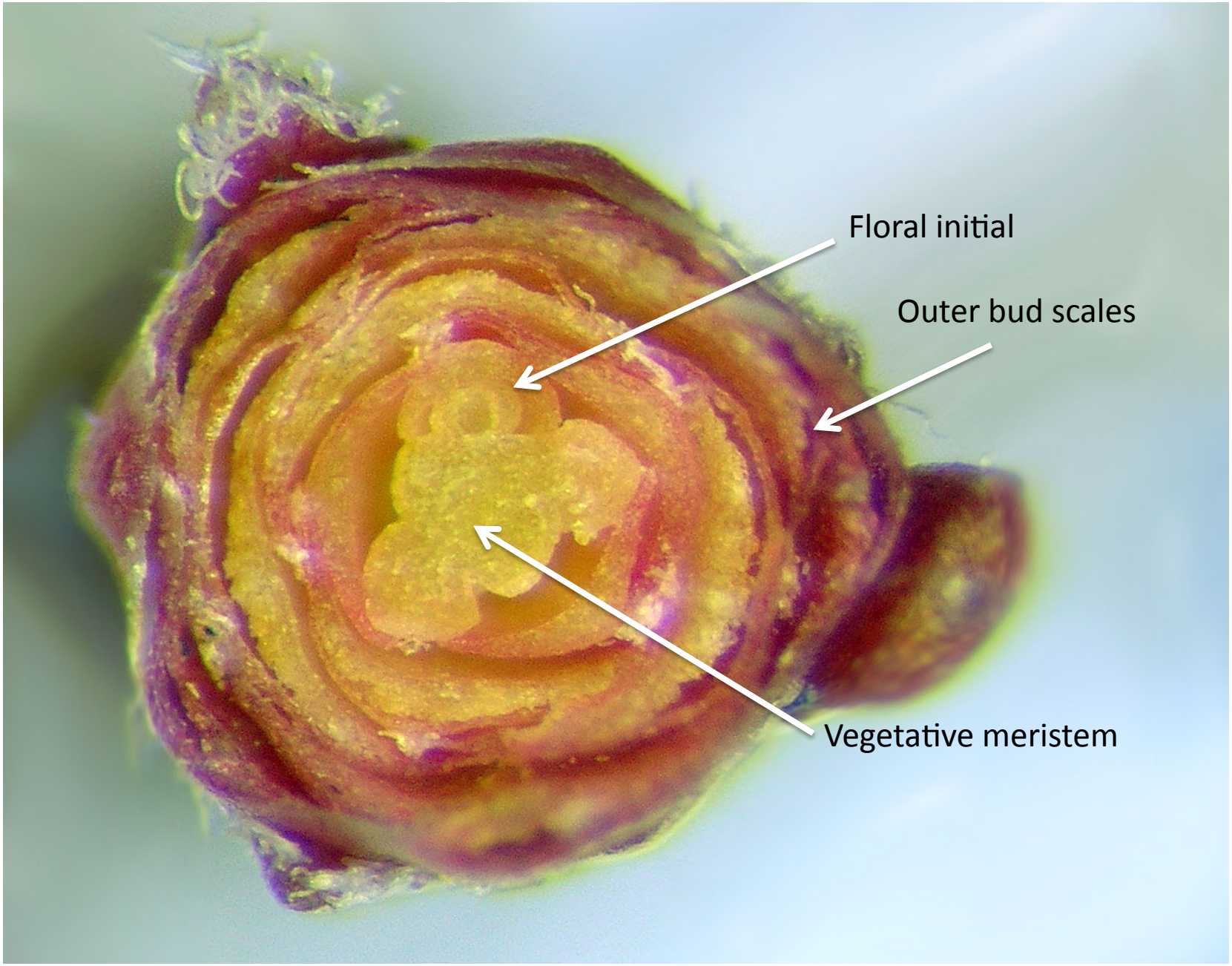
Input	Conventional	Cycling
Average Water Use (Gallons/Acre/night)	30,000	18,500
Average Fuel Use (Gallons/Acre/night)	53	21
Cost of Fuel ($/Acre/ night)	$164	$80

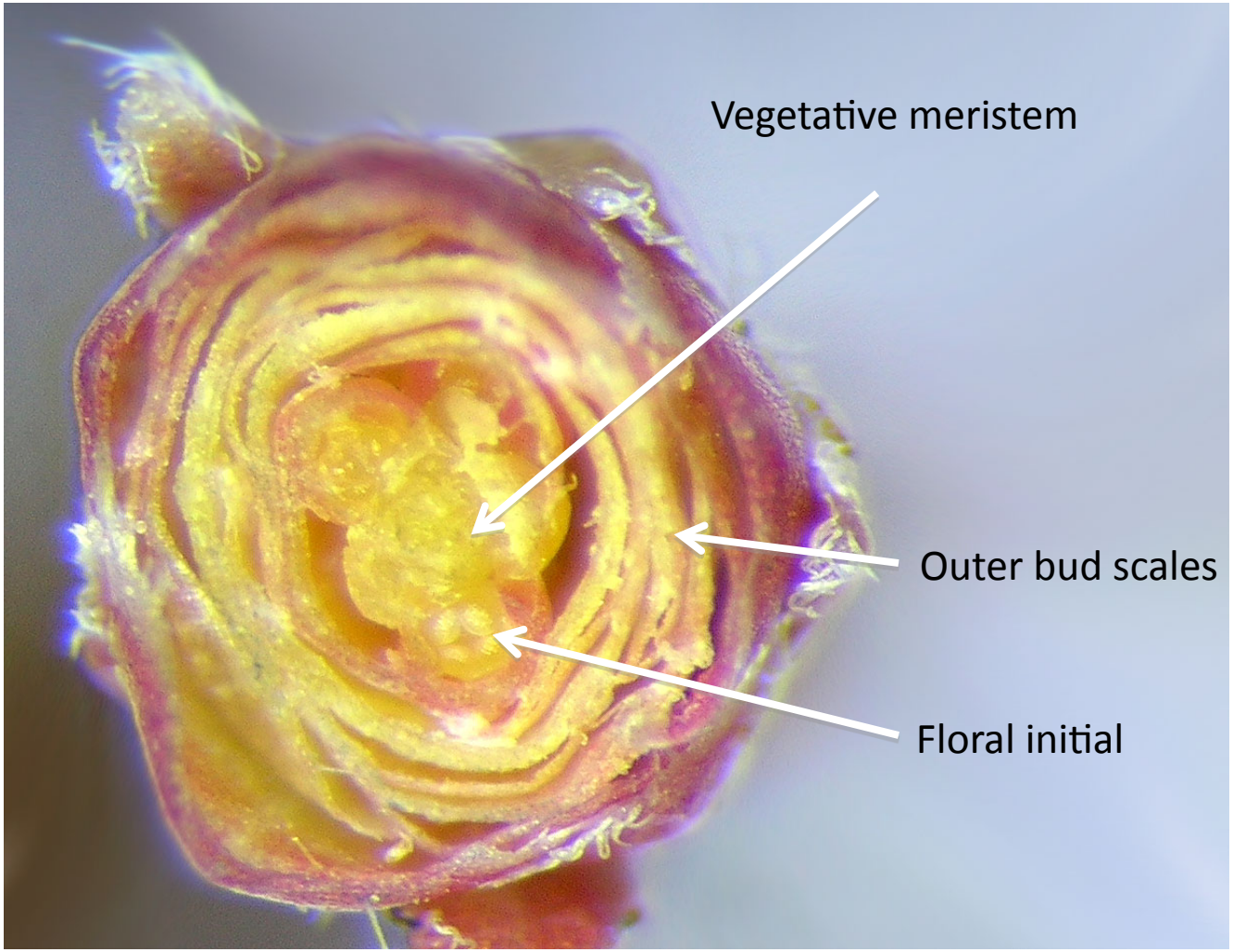
Methods

- Turn on 2 degrees above tolerance
- Turn off 3 additional degrees above or 31.5F on really cold nights
- Some raise second and subsequent restart temps

Bud damage on April 15, 2013

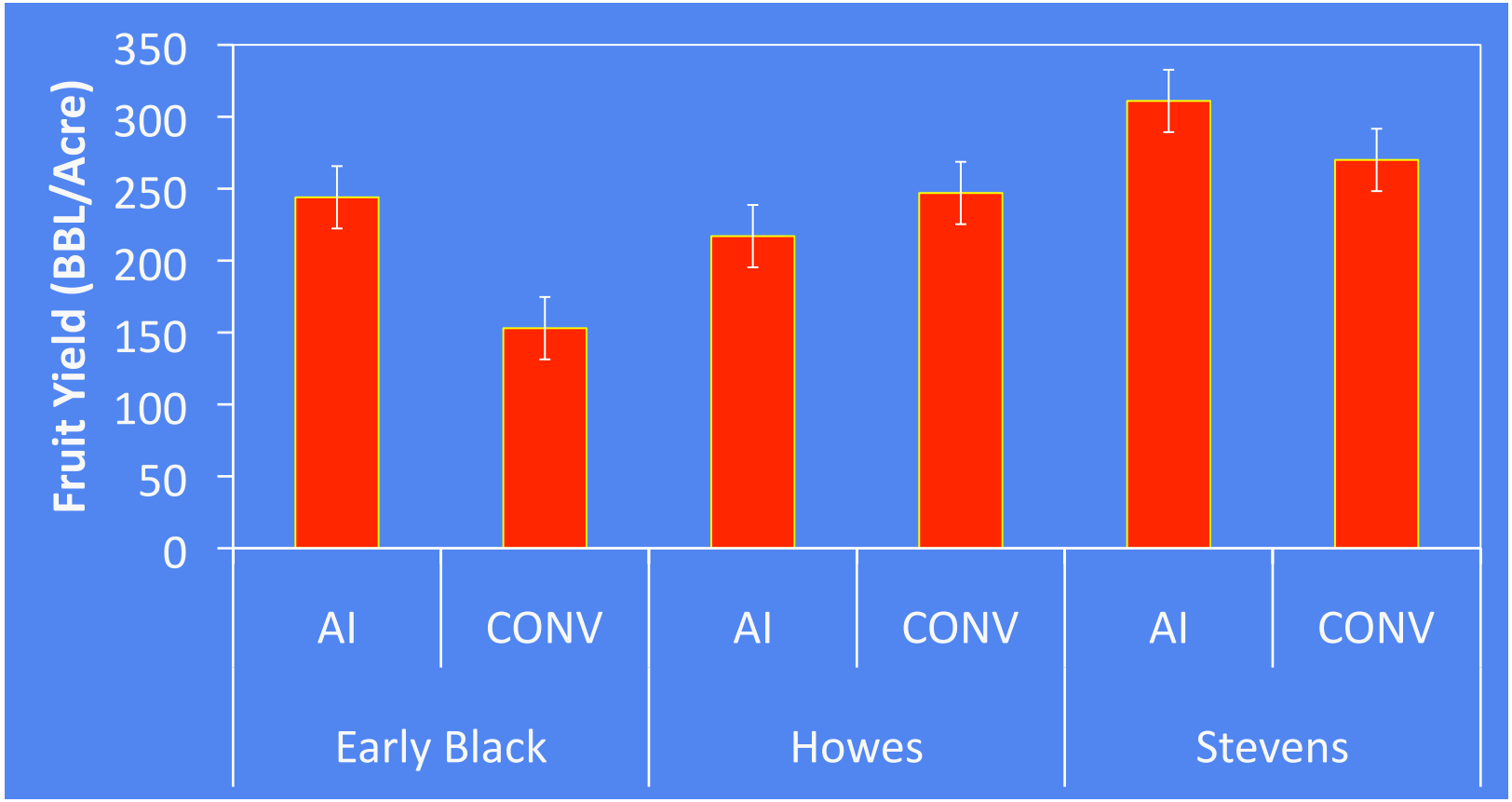



Floral initial
Outer bud scales
Vegetative meristem



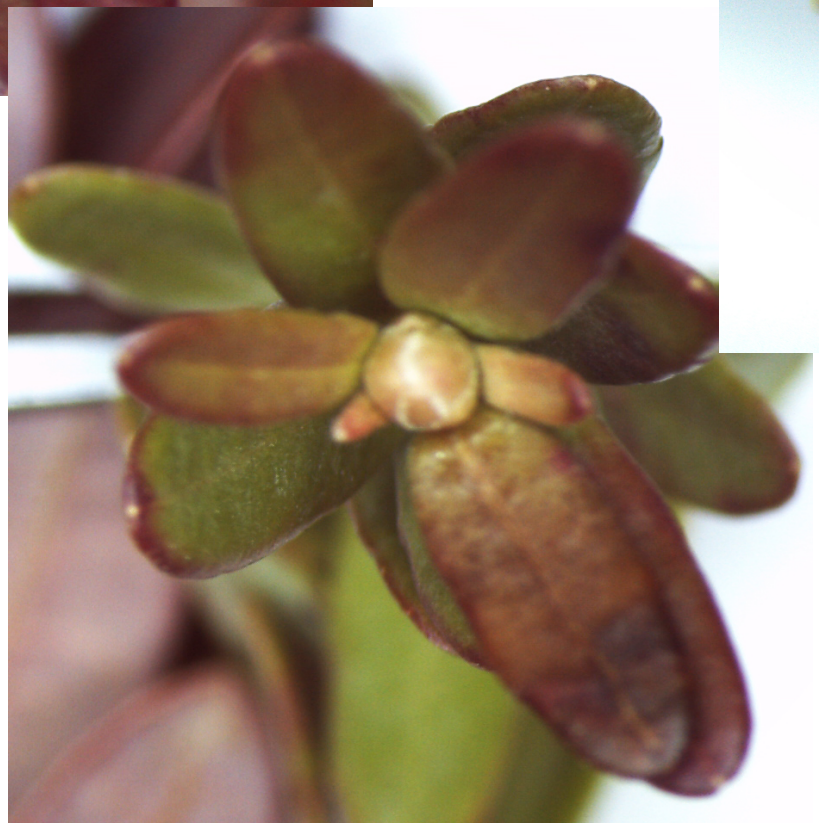
Source: DeMoranville

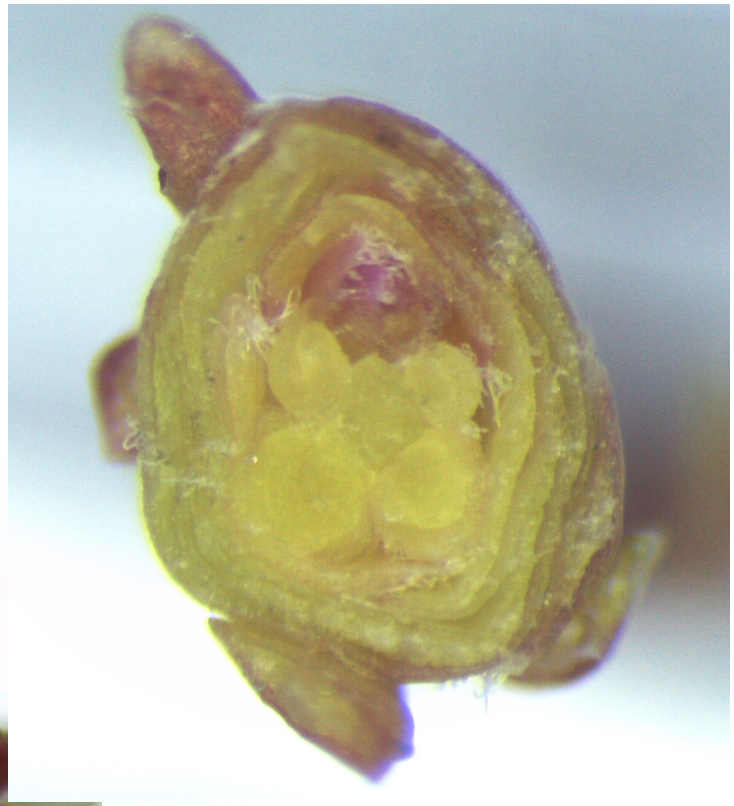
Frost Protection Method and Cultivar Effect on Fruit Yield in 2013 – AI was not a problem



Frost

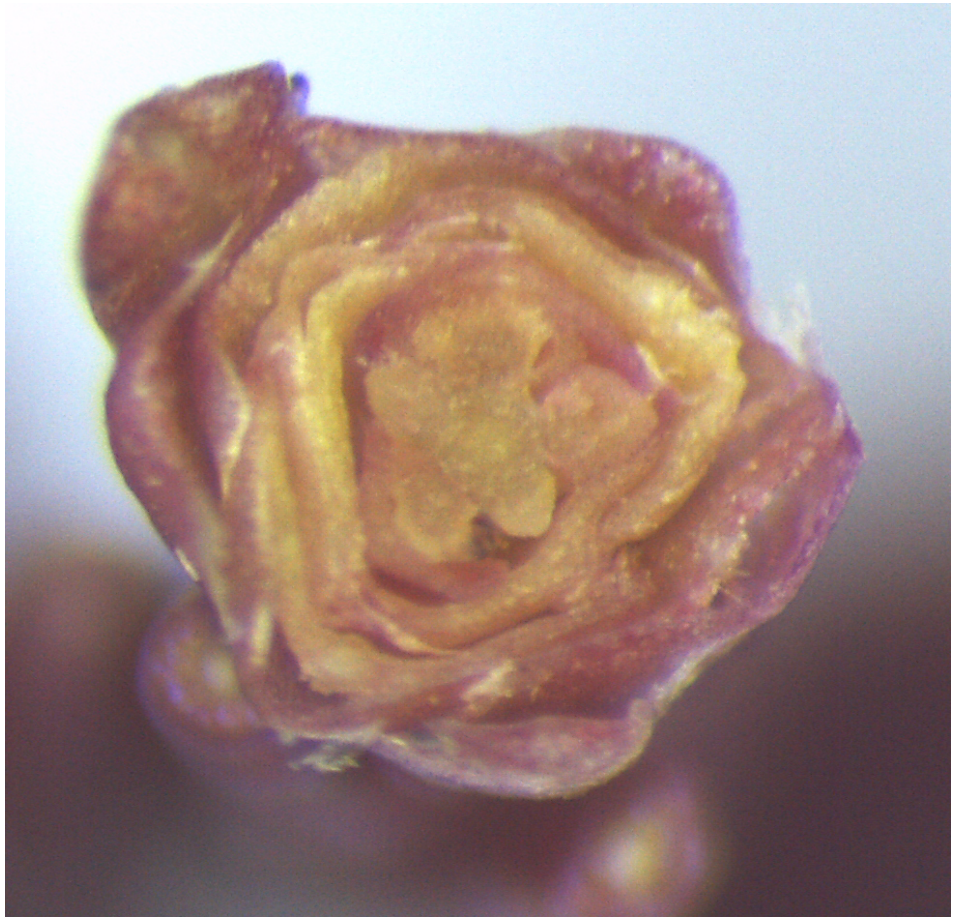
- Tolerances at State bog as of 4/14
  - EB 18°F
  - H 18°F
  - BL 20°F
  - ST 20°F
- Tolerance photos and information
  - http://www.umass.edu/cranberry/
  - Look under ‘Crop Information’ and choose ‘Frost Tolerance’





Early Black
4.14.14

Howes
4.14.14



Ben Lear
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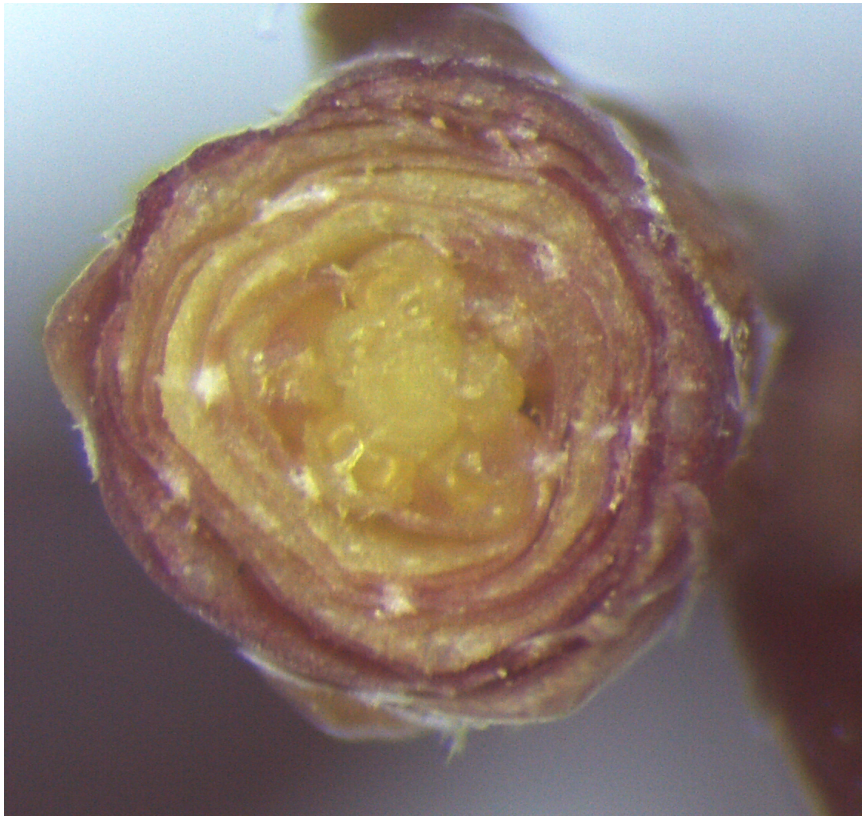
Stevens



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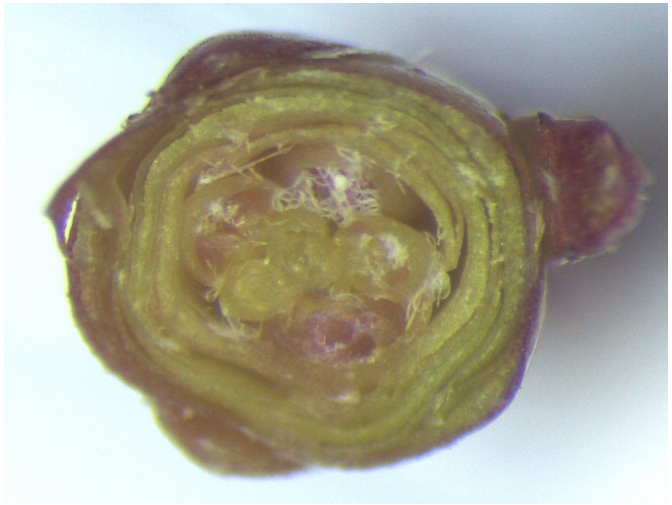

Crimson
Queen
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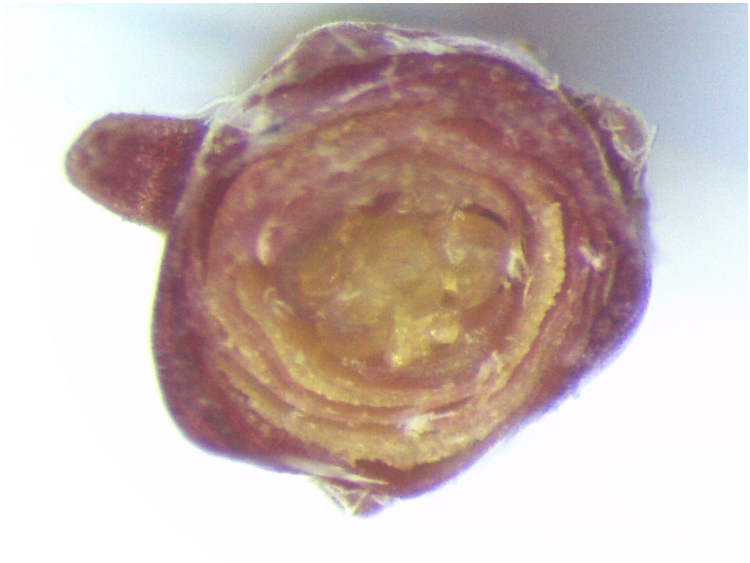

Mullica
Queen
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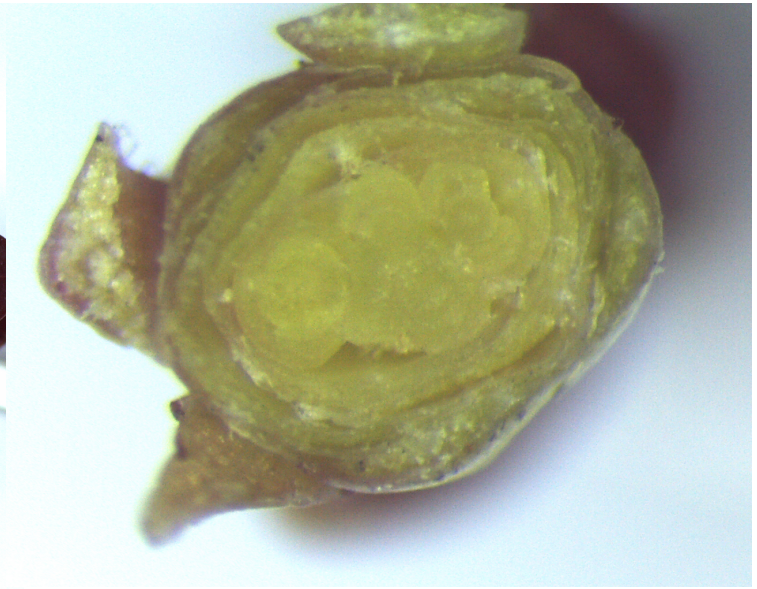

Demoranville
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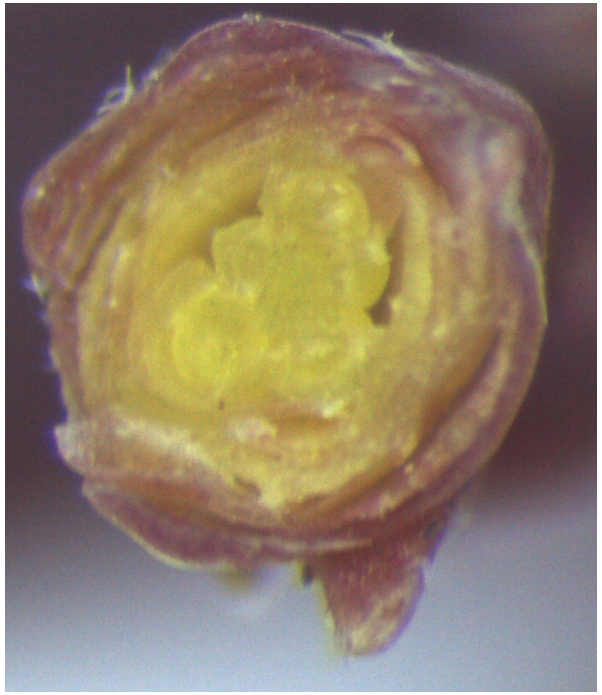

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4.14.14

Protecting on really cold nights

- Windy
  - Frost flood?
  - Just up into the vines, can hold over if pre-bud break
- Sprinkling and making ice
  - Don't want all ice/no water
  - If ice evaporates lose ~7X heat compared what released to when it froze

When to turn off in the AM?

- 3-5 degrees above tolerance
- Do not have to melt all ice
  - If sun on ice and 3-5 degrees above tolerance, shut down
  - Ice will be wet so only normal heat loss on melting
    - That's why the 3-5 degrees

Questions?